

**CLAIMS:**

1. An electronic camera operable in a still  
image mode and in a motion preview mode, the  
5 improvement wherein

the still image mode uses a relatively more  
complex digital image processing technique to produce  
high quality still images, and the motion preview mode  
uses a relatively more simple digital image processing  
10 technique to produce a preview image of acceptable  
quality prior to initiation of the still image mode.

2. An electronic camera as claimed in claim  
1 wherein both modes operate on color images.

3. An electronic camera as claimed in claim  
15 2 further including an image sensor having an array of  
color image pixels and a display having a smaller array  
of color display pixels, and wherein the image  
processing technique used during the motion preview  
mode maps the array of color image pixels into the  
20 smaller array of color display pixels.

4. An electronic camera as claimed in claim  
3 wherein the image processing technique used during  
the motion preview mode also modifies the saturation of  
the color image pixels.

5. An electronic camera as claimed in claim  
3 wherein the display is a liquid crystal display (LCD)  
comprising discrete LCD display pixels, and the image  
processing method used during the motion preview mode  
maps more than one image pixel from the sensor to  
30 generate each value for individual LCD display pixels.

6. An electronic camera as claimed in claim  
1 wherein the more complex image processing technique  
implemented in the still image mode is implemented in  
software, and more simple image processing technique  
35 implemented in the motion preview mode is implemented  
in an application specific integrated circuit.

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7. ~~An electronic camera operable in a still~~  
image mode and in a motion preview mode, said  
electronic camera comprising:

5 an image sensor including a two-dimensional  
array of image pixels covered by a mosaic pattern of  
color filters, said image sensor providing a stream of  
color pixel signals at an output thereof suitable for  
still imaging;

10 an analog-to-digital stage for converting the  
color pixel signals to digital pixel signals;

a color display comprising a discrete two-  
dimensional arrangement of color display pixels, said  
color display having fewer color display pixels than  
the number of image pixels on the image sensor; and

15 a preview mode processor for mapping the  
digital image pixel signals into at least a viewable  
portion of the color display pixels by combining same-  
colored image pixels into a fewer number of  
intermediate pixels that correspond to the arrangement  
20 of the color display pixels.

8. An electronic camera as claimed in claim  
7 wherein the mosaic pattern of color filters covering  
the image sensor is different than the arrangement of  
color display pixels.

25 9. An electronic camera as claimed in claim  
8 wherein said mosaic pattern of color filters is the  
following pattern

30 R G R G  
G B G B  
R G R G  
G B G B

35 and wherein the preview mode processor combines the  
digital pixel signals into a fewer number of RGB pixels  
by averaging two or more of the same-colored image  
pixels in each line to provide averaged display pixels.

10. An electronic camera as claimed in claim  
~~9 wherein the preview mode processor further modifies~~

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the saturation of the averaged display pixels by adding or subtracting portions of one or more of the other colors to each averaged display pixel.

5 11. An electronic camera as claimed in claim 7 wherein the image sensor and the viewable portion of the color display have the same aspect ratios such that substantially all of the image pixel signals can be mapped into substantially all of the color display pixels.

10 12. An electronic camera as claimed in claim 7 wherein the image sensor and the color display have different aspect ratios such that substantially all of the image pixel signals are mapped into the viewable portion of the color display pixels, leaving another  
15 portion of the color display pixels available for non-imaging use.

13. An electronic camera operable in a still image mode and in a motion preview mode, said electronic camera comprising:

20 an image sensor comprising a two-dimensional color filter array, a two-dimensional array of image pixels arranged in rows and columns with respect to the color filter array, and a horizontal register for outputting rows of color pixel signals;

25 an analog-to-digital stage for converting the color pixel signals to digital pixel signals;

30 a color display comprising a specific two-dimensional color pattern of display pixels arranged in rows and columns, having substantially fewer rows and fewer columns than the image sensor;

a still image processor for processing the digital pixel signals obtained during the still image mode, and

35 a preview mode processor for mapping the digital pixel signals obtained during the motion preview mode into the display pixels according to a procedure that digitally maps the digital pixel signals

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~~corresponding to the color filter array of the sensor into the color pattern of the color display.~~

14. An electronic camera as claimed in claim 13 wherein the preview mode processor further modifies the saturation of the digital pixel signals.

15. An electronic camera as claimed in claim 13 wherein the still image processor utilizes a software procedure for processing the digital pixel signals and the preview mode processor includes a fixed digital circuit embedded in an application specific integrated circuit (ASIC) for processing the digital pixel signals.

16. An electronic camera as claimed in claim 15 wherein the ASIC processes the digital pixel signals more rapidly than the software procedure.

17. An electronic camera as claimed in claim 13 wherein the color filter array covering the image sensor is different than the color pattern of display pixels.

18. An electronic camera as claimed in claim 17 wherein said color filter array has the following pattern

R G R G  
G B G B  
R G R G  
G B G B

and wherein the preview mode processor combines the digital pixel signals into a fewer number of RGB pixel signals by averaging two or more of the same-colored image pixel signals in each line to provide averaged ~~RGB pixel signals.~~

19. An electronic camera operable in a still image mode and in a motion preview mode, said electronic camera comprising:

an image sensor comprising a two-dimensional array of image pixels arranged in rows and columns, and

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a horizontal register responsive to clock signals for outputting rows of image pixel signals;

an analog-to-digital converter for converting the output image pixel signals into digital image pixel signals;

a still image processor for processing the digital image pixel signals obtained during the still image mode;

a motion preview processor for processing the digital image pixel signals obtained during the motion preview mode; and

a timing generator for operating the image sensor according to respectively different clock signal frequencies depending upon which operating mode is being used.

20. An electronic camera as claimed in claim 19 wherein the clock frequency for operating the image sensor in the motion preview mode is higher than the clock frequency for operating the image sensor in the still image mode.

21. An electronic camera operable in a still image mode and in a motion image mode, said electronic camera comprising:

an image sensor including a two-dimensional array of image pixels and a horizontal readout section for providing an output stream of image pixel signals;

an analog-to-digital stage for converting the output image pixel signals into digital image pixel signals; and

a timing and control section for driving the image sensor to provide the output stream of image pixel signals according to a pixel readout procedure involving clock signals, said pixel readout procedure being different for the two modes.

~~22. An electronic camera as claimed in claim 21 wherein the pixel readout procedure comprises separate clock signal rates for the still image mode and the motion image mode.~~

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23. An electronic camera as claimed in claim 22 wherein the clock signal rate for the still image mode is slower than for the motion image mode.

5 24. An electronic camera as claimed in claim 21 wherein the horizontal readout section comprises two horizontal readout registers and the pixel readout procedure comprises use of one horizontal register for the still image mode and the use of both horizontal registers for the motion image mode.

10 25. An electronic camera as claimed in claim 1 wherein the still image mode includes the capture of a single image or the capture of a burst of images.

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